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BIRD-BANDING

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BIRD-BANDING

A JOURNAL OF ORNITHOLOGICAL INVESTIGATION

VOL. IV JULY, 1933 NO. 3

NESTING SUCCESS DURING THREE SEASONS IN A SONG SPARROW POPULATION

By MARGARET MORSE NICE

THE number of young fledged in a bird population depends on many factors: survival of adults during the nesting season; length of the nesting season, which is conditioned by the weather both at the beginning and the end; number of eggs laid and number of broods attempted; amount of food available for the young; efficiency of the parents; and degree of interference by a large variety of influences, including human activities, heavy rains, parasitism by the Cowbird (*Molothrus ater ater*) in certain regions, and the various enemies—reptilian, mammalian, and avain—that prey upon the eggs and young.

For the past four years I have been studying Song Sparrows (*Melospiza melodia beata*) on "Interpont," an area of some forty acres of waste land, described more fully elsewhere (Nice, '31a, '31b), in the flood plain of the Olentangy River west of our home in Columbus, Ohio. Most of the adult birds involved have been banded with colored and aluminum bands (the latter always on their left legs), while each nestling has been given an aluminum band on its right leg.

In 1929 I concentrated on two pairs of Song Sparrows, but since then have studied a considerable number of these birds, having results on the success and failure of 147 nests during three seasons. Observations were continued throughout the season of 1930, but in 1931 they were terminated on June 6th, and in 1932 on June 14th. The results for the first two years were closely similar, but the third showed marked differences.

NUMBER OF YOUNG FLEDGED PER PAIR IN ONE SEASON

The season of 1929 was exceptionally early, nesting by the Song Sparrows beginning ten days earlier than in 1930 or 1931 and fully two weeks before it did in 1932 and 1933. At the time of our departure on July 17th I believed the nesting activities

of the two pairs I was studying were practically over (although Song Sparrows rarely nest into September). Each pair made four attempts; one pair had one failure and three successes, raising nine young, while the other had two failures and two successes, raising five young.

In 1930 the numbers of young fledged per pair by fifteen pairs that survived the season were as follows: 0, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 6, 7, 7, 10—a total of 64, an average of 4.3 a pair. The last four figures represent two broods each; hence 18 broods were raised, averaging 3.6 young to a brood.

With sixteen pairs the numbers of attempts at nesting were known; four made four attempts, while twelve made only three. The numbers of successes (a "success" meaning that at least one Song Sparrow was raised) ranged from 0 to 3, eight pairs having one success each, and six pairs two.

During the year of 1930 there occurred in Ohio "the *greatest drought* of record" . . . "amounting almost to a climatic disaster." The three months of the Song Sparrow breeding season were characterized by a "warm and abnormally dry" May, "the driest June save one in 47 years," and the "driest July in 77 years" (Alexander, '31). The mean temperature in July was 77°F. or 2.1° above normal.

This extraordinary drought did not affect the young in the nest adversely, only two young in the whole season dying of starvation; this happened in the latter part of June with a pair of parents both of which had been hatched the previous year. The July young left the nest at the normal time without loss from lack of food, but it is true that most of the broods were small to begin with—four birds in but one nest, three birds in two nests, and two birds in three nests.

But the drought brought on the molt of the adults about two weeks early and thereby put a stop to nesting. The evidence for this is two-fold. In 1929 I did not record any signs of molt before we left Columbus on July 17th, but in 1930 quite a number of the adults were decidedly molting by this date. Moreover, fall singing by the adult males on their territories started from fourteen to eighteen days earlier in 1930 than it did in 1929 or 1931. There was far more singing in the fall of 1930 than there has been in the other three falls that I have been studying the Song Sparrows, evidently correlated with the abnormally early finish of the molt.

In Cornwall, Ryves ('30) observed that in 1929 Blackbirds (*Turdus merula*) and Song Thrushes (*Turdus philomelus*) failed to raise third broods, perhaps because of "a drought and heat wave late in June and almost the whole of July."

Poultrymen can bring on the molt in laying hens by reducing their water ration, by giving them only grain to eat and thereby upsetting their protein balance. Could something of this sort have happened with the Song Sparrows?

It is clear that the breeding season of 1930 was cut short and that in a normal year many of the pairs would have made further attempts at nesting and more young would have been fledged. The raising of only 4.3 young per pair cannot be representative of the average season.

SIZE OF SETS AND SIZE OF BROODS

The numbers of Song Sparrow eggs in the nests found from 1930 to 1932 are shown in Table I and the size of the broods raised in Table II. The size of the sets are given, not as they were laid, but as they stood after a loss of 14 to 16 eggs due to Cowbird activity. (Cowbird eggs and nestlings are omitted.)

TABLE I

SIZE OF SONG SPARROW SETS ON INTERPONT
(Eggs eaten by Cowbirds not included)

	Numbers of Nests Containing						*Total*
	5 eggs	*4 eggs*	*3 eggs*	*2 eggs*	*1 egg*	*0 egg*	*Nests*
1930	14	25	19	2	1	0	61
1931	14	13	4	3	1	1	36
1932	14	26	9	1	0	0	50
	Per cent of Nests						
1930	23.0	41.0	31.0	3.2	1.7	0	100
1931	38.8	36.1	11.1	8.2	2.9	2.9	100
1932	28.0	52.0	18.0	2.0	0	0	100

TABLE II

SIZE OF BROODS RAISED

	Numbers of Nests Containing					*Total*
	5 young	*4 young*	*3 young*	*2 young*	*1 young*	*Nests*
1930	6	8	10	5	0	29
1931	7	3	4	2	2	18
1932	1	6	9	6	8	30
	Per cent of Nests					
1930	20.7	27.6	34.5	17.2	0	100
1931	38.8	16.8	22.2	11.1	11.1	100
1932	3.3	20.0	30.0	20.0	26.7	100

Sets containing one and two eggs either were incomplete when destroyed or contained Cowbird eggs (five cases with two eggs); the one that contained no eggs was deserted because of the deposition of a Cowbird's egg. The large number

of three-egg sets in 1930 is partly due to the inclusion of late nestings. The high incidence of five-egg sets in 1931 probably indicates a large proportion of mature females this year, occasioned by the shortened breeding season of 1930 and a consequent lack of young birds. (Juvenile females usually lay four eggs in each set, while older females very often lay five eggs in each of the first two sets.)

Table II shows a considerable shrinkage. In 1930 and 1932 there were more nests raising three birds than any other number, but in 1931 there was a large preponderance of nests raising five young. The curious thing about 1932 is the fact that exactly one nest raised five young, while six raised two, and eight raised only one Song Sparrow!

An examination of the broods of single birds gives the following data: In 1931 one Song Sparrow was raised with two Cowbirds, while in the other case the male parent had been killed and the mother during a spell of cold weather succeeded in raising only one of the young (Nice '32). In 1932 the unfavorable factors were addled eggs, a combination of Cowbird nest-mates and an early drought (five young perishing in three nests) and the strange fact that enemies removed all but one nestling out of each of three nests. (When young disappeared one by one, I attributed their death to starvation, but when two, three, or four vanished over-night, I considered that some enemy had taken them.)

Completely and Partially Successful Broods

Table III gives the numbers and percentages of those broods each season that were entirely successful and those that were only partially so, only Song Sparrow eggs and nestlings being considered.

TABLE III

Completely and Partially Successful Nests

	Completely Successful Nests				*Partially Successful Nests*			
	Nests		*Eggs Laid*	*Young Fledged*	*Nests*		*Eggs Laid*	*Young Fledged*
	No.	*% of Total*			*No.*	*% of Total*		
1930	18	64.1	73	73	11	35.9	43	29
1931	11	61.1	50	50	7	38.9	27	15
1932	4	13.3	17	17	26	86.7	111	59

Loss
In Partially Susccesful Nests

	Nos. of Individuals	*Loss per Partially successful nest*	*Loss per Total successful nest*	*Per cent of Partially successful nests*	*Per cent total successful nests*
1930	14	1.3	0.49	32.6%	12.0%
1931	12	1.7	0.66	44.4%	15.6%
1932	52	2.0	1.73	46.8%	40.6%

Here it will be seen that in 1930 and 1931 nearly two thirds of the broods were entirely successful, but that in 1932 this was true of only 13 per cent. Besides the great numbers of nestlings effected, the loss per nest was appallingly high, an average of two eggs or young out of every brood. In the first two years there was a 12 to 15 per cent loss out of all the successful nests, but in 1932 it reached the proportions of 40 per cent!

NUMBERS OF YOUNG RAISED IN 147 NESTS IN THREE SEASONS

In 1930 the outcome of 61 nests was known; in 1931, 36 nests; and in 1932, 50. Table IV gives a summary of the nesting success in the three seasons.

TABLE IV

NUMBERS OF YOUNG RAISED IN 147 NESTS DURING THREE SEASONS

		The Nests			
		No. in which eggs hatched	*Per cent in which eggs hatched*	*No. in which young were fledged*	*Per cent in which young were fledged*
Year	*Total No.*				
1930	61	44	72.1	29	47.5
1931	36	27	75.0	18	50.0
1932	50	38	76.0	30	60.0
Total	147	109	74.1	77	52.4

	The Eggs							
	No. Laid		*Hatched*		*Fledged*		*Average Fledged*	
Year	*Total*	*Per Nest*	*No.*	*Per cent*	*No.*	*Per cent*	*Per total nest*	*Per successful nest*
1930	236	3.9	161	68.2	102	43.2	1.7	3.5
1931	143	4.2	103	72.0	65	45.5	1.8	3.6
1932	206	4.1	125	60.7	76	36.8	1.5	2.5
Total	585	4.0	389	66.5	243	41.5	1.7	3.2

In examining the table it must be remembered that the 1930 nests were found throughout the season, while in the two later years only the earlier nests are involved. This gives a slight advantage to the later years in the numbers of eggs per nest, since third and fourth sets are often smaller than the first two.

If we take the nest as our criterion, we find that the eggs hatched in 72, 75, and 76 per cent respectively, and the young were fledged in 47.5, 50, and 60 per cent of the nests during the three years. This gives a fair representation of affairs during the first two years, but a wholly false one in 1932. If we consider the fate of the eggs, we find a similar picture to that with the nests for the first two years, but an entirely different one in 1932.

The most significant set of figures in this table are the percentages of the young that were fledged—43.2 in 1930, 45.5 in 1931, and 36.8 in 1932. Very striking also are the average numbers of young fledged, both per total nest (1.7 in 1930, 1.8 in 1931, and 1.5 in 1932) and per successful nest (3.5, 3.6 and 2.5 in the three years).

1930 and 1931 are remarkably similar in all the percentages and averages, with a slight advantage for the latter in every respect, due partly to the somewhat larger number of eggs per nest and also a low incidence of Cowbird parasitism during that year.

The season of 1932, however, was markedly different from its predecessors, first in the very high number of nests that "succeeded," second, in the very low number of birds fledged, especially in the number raised per successful nest. The first result seems to have come from a somewhat lessened number of enemies destructive to the eggs and young, and also from the removal in three nests of all but one nestling by these same enemies. The reasons for the small number of young fledged lay in a higher proportion than usual of sterile and addled eggs, a marked increase in Cowbird parasitism, and a disastrous drought in May.

It may be of interest to compare these tables of nesting success of the Song Sparrow with the results of six investigations in other localities in this country and Great Britain. The majority of the species involved have altricial young.

TABLE V

SUCCESS OF NESTS IN SEVEN DIFFERENT INVESTIGATIONS

Author	*Locality*	*Number Species*	*Number Nests*	*Number Eggs Laid*	*Number Hatched*	*Young Fledged*
Nice	Ohio	1	147	585	389	243
Clabaugh ('25)	California	13	38	187	103	76
Clabaugh ('26)	"	17	39	168	104	68
Nicholson ('30)	Scotland	?	156	687	420	300
Pickwell ('31)	Illinois	1	30	102	79	46
Praeger ('21)	Scotland	?	240			In 99 nests
Potter ('15)	Pennsylvania	18	113			In 60 nests

Author	*Locality*	*Per cent Eggs Hatched*	*Per cent Eggs Fledged*	*Per cent Casualties*
Nice	Ohio	66.5	41.5	58.5
Clabaugh ('25)	California	55.0	41.0	59.0
Calbaugh ('26)	"	62.0	40.5	59.5
Nicholson ('30)	Scotland	61.1	43.7	56.3
Pickwell ('31)	Illinois	77.4	45.1	54.9
Praeger ('21)	Scotland		41.2 (nests)	58.8 (nests)
Potter ('15)	Pennsylvania		53.1 (nests)	46.9 (nests)

The percentage of eggs hatched runs in the sixties in three cases, but as low as 55 in one instance and as high as 77 in another (the number of nests involved being rather few in both cases). But the percentage of fledging is closely similar, ranging from 40.5 to 45.1. Potter has a higher percentage—53.1—but this was of nests, not eggs, which in all probability was somewhere in the forties.

ANALYSIS OF THE LOSS OF EGGS AND YOUNG

In Table VI the loss of eggs and young is analyzed for each of the three seasons, the total number of eggs laid being used as the basis for all the percentages. This total number is not quite certain, since some nests were found with Cowbird eggs or young and only a small quota of Song Sparrow eggs or young, and it was not possible to be sure how many Song Sparrow eggs had originally been laid. In these cases I added the smallest number of Song Sparrow eggs that was consistent with my experience in these matters.

TABLE VI

ANALYSIS OF LOSS OF EGGS AND YOUNG
IN 147 SONG SPARROW NESTS

		1930			1931		
Total		*Eggs* 236	*Young* 161	*Both*	*Eggs* 143	*Young* 103	*Both*
Destroyed by Enemy	Nos.	48	49	97	23	29	52
	%	20.3	20.7	41.0	16.1	20.2	36.3
Eggs Sterile or addled	Nos.	5	..	5	9	..	9
	%	2.2	..	2.2	6.3	..	6.3
Cowbird Direct Action	Nos.	4	3	7	2	..	2
	%	1.7	1.2	2.9	1.4	..	1.4
Parental Failures	Nos.	1	5	6	3	3	6
	%	0.4	2.2	2.6	2.1	2.1	4.2
Man-Cultivation, Robbery	Nos.	12	0	12	0	0	0
	%	5.0	0	5.0	0	0	0
Parents Killed, Nest undisturbed	Nos.	5	0	5	3	5	8
	%	2.2	0	2.2	2.1	3.5	5.6
Young Starved	Nos.	..	2	2	..	1	1
	%	.	0.9	0.9	..	0.7	0.7
Total	Nos.	75	59	134	40	38	78
		31.8	25.0	56.8	28.0	26.5	54.5

		1932			Total		
Total		*Eggs* 206	*Young* 125	*Both*	*Eggs* 585	*Young* 390	*Both*
Destroyed by Enemy	Nos.	36	26	62	107	104	211
	%	17.5	12.5	30.0	18.3	17.8	36.0
Eggs Sterile or addled	Nos.	18	..	18	32	..	32
	%	8.9	..	8.9	5.6	..	5.6
Cowbird Direct Action	Nos.	8	1	9	14	4	18
	%	3.9	0.5	4.4	2.4	0.7	3.1
Parental Failures	Nos.	2	4	6	6	12	18
	%	0.9	1.9	2.8	1.0	2.1	3.1
Man-Cultivation, Robbery	Nos.	10	0	10	22	0	22
	%	4.8	0	4.8	3.7	0	3.7
Parents Killed, Nest undisturbed	Nos.	7	0	7	15	5	20
	%	3.4	0	3.4	2.5	0.8	3.3
Young Starved	Nos.	..	18	18	..	21	21
	%	..	8.9	8.9	..	3.6	3.6
Total	Nos.	81	49	130	196	146	342
		39.4	23.8	63.2	33.5	25.0	58.5

In this table under the title "Cowbird—Direct Action" come only those cases where eggs were surely eaten or removed, or when a young Song Sparrow was crushed or crowded out by a young Cowbird. Under "Miscellaneous Parental Failures" come the occasional disappearance of eggs (6 cases), young carried off while hatching (6 cases), young pulled out of the nest (3 cases), or the last young deserted in the nest (3 cases); all of these instances being attributable to parental errors, except, perhaps, the occasional disappearance of the eggs, which is a difficult matter to explain. Under "Man" come two cases of destruction of nests through cultivation, two nests that were robbed, and one that I thought might have been deserted because of my daily visits, although no other such case has occurred. When parents were killed and the nest undisturbed, boys were probably responsible in some instances, other enemies in others.

One other factor, destruction by rain, was involved in 1929, causing the death of two nestlings, but did no harm during the three following years in the nests under my observation. However, on May 11th and 13th, 1933, there were floods that destroyed the majority of the ground nests in the river-valleys in central and southern Ohio, affecting five of the thirteen

Song Sparrow nests I had found on Interpont. The birds will have to have a long and successful season during the rest of the summer, if their losses from this major disaster are to be made good.

Comparative Loss to Eggs and Young. Each year there has been more loss of eggs than of young, the average of the three years giving a loss of one third of the original eggs as eggs, and one fourth as young. The percentage of the young that hatched that left the nest in safety was 63.3, 63.1, and 60.8 in the three years respectively—an average of 62.5, slightly less than the average percentage of the total eggs that hatched, 66.5.

Is it more dangerous to be an egg or a nestling? The egg is in the nest from 12 to 18 days, the young from 9 to 10. If we divide the average loss of the eggs as eggs—33.5 per cent—by 15 (days), we find a daily loss of 2.1 eggs in every hundred. But if we divide the average loss of the original eggs when they are nestlings—25 per cent—by 10, we find a daily loss of 2.5 individuals. If we consider only the first two years, which were probably more typical than was 1932, we divide 30.4 by 15 and get a 2 per cent daily loss of eggs, but with 25.5 divided by 10 we find the same high loss of young. It is evidently, day for day, somewhat more dangerous to be a nestling than an egg.

It is significant that practically as many young as eggs were destroyed by enemies. It is probable that some animals (cats for instance) prefer young to eggs. Several times some enemy has carried off the Song Sparrow eggs, leaving the Cowbird eggs, yet the Cowbird nestling is taken as readily as the Song Sparrow. Some predators may be attracted to the nest by the begging note of the young during the last few days of nest life. Yet at this same time they must be immune from the attacks of the smaller of their enemies, such as little snakes that would eat the eggs.

The factor that effects only the eggs is that of sterile and addled eggs; that affecting only the young is starvation. It happens that human interference has effected only the eggs, but it is perfectly possible for this element to destroy the young too. The greater damage to eggs than to young through the killing of parents would seem to have been a matter of chance. The Cowbird parent accounts for more individual Song Sparrows by disposing of eggs than does the young by crushing or crowding.

In these three seasons the greater loss of eggs than young was due to the sterile and addled eggs, the activities of the adult Cowbird, and the activities of man.

"*Enemies.*" The largest category of destruction of both eggs and young is that comprehensive term "enemy," including all animal predators that destroy the eggs or young. Here it is probable that the native creatures—snakes, weasels, skunks, opossums, and Blue Jays (*Cyanocitta cristata*)—and the much worse introduced predators Ring-necked Pheasants (*Phasianus colchicus torquatus*), dog, rat, and cat—all take toll, but it is impossible for me to apportion the blame. It is interesting to note the steady dimunition in the loss due to enemies from year to year. This may be due to a real decrease in predators; opossums and weasels have become very rare, dogs were less troublesome in 1932 than in 1931, snakes are constantly warred upon by the boys of the neighborhood, while we have been able to reduce the cat population to some extent.

Sterile and Addled Eggs and Other Parental Failures. The real proportion of sterile and addled eggs must be higher than the figures show, because it is only in those nests that survive through hatching that this matter can well be checked in a study with wild birds. Such eggs were a negligible factor in 1930, only two of the former and three of the latter being found in a total of 236 eggs. The next year the percentage is abnormally high, because five of the seven sterile eggs occurred in two nests in which there was some defect in the male (one had had half of his right leg shot off). In 1932 there were 10 sterile and 8 addled eggs, amounting to almost 9 per cent of the 206 eggs.

It is natural to attribute the high incidence of unhatchability in 1932 to the cold spring—the sterile eggs to the decreased sexual excitement, the addled eggs to chilling during the irregular incubation of the first few days. Yet these eggs were laid after the cold weather was past. More observations are needed before we can decide upon a normal percentage of unhatchable eggs with these birds.

Song Sparrow parents are efficient, only 3.1 per cent loss being directly attributable to failures on their part, quite in contrast to Mourning Doves (*Zenaidura macroura*) for instance, where one sixth of the nestlings in "successful" nests have been lost through frailty of the nests (Nice, '23; Gates, '09). If sterile and addled eggs are added to "parental failures," we find 8.7 per cent loss of all the eggs laid due to adult inefficiency. If we also add the three starved young during the first two years, we get a percentage of 9.2.

Starvation. In normal seasons there is a very small loss of nestlings from starvation. But in 1932 no less than 18 died from

lack of food. This condition was correlated both with a heavy Cowbird infestation and with a disastrous drought in May, for this month was the driest May in Columbus in the 53 years of the Weather Bureau's records, only .79 of an inch of rain falling. Thirteen of the 18 Song Sparrows had Cowbird nestmates. There was no loss from starvation in the nestlings fledged before May 20th, but in the next ten days only two broods were entirely successful, while eight suffered loss. In June no parents raised all the young hatched, while in six nests young died from lack of sufficient food. No real rain came until June 27th. Under normal conditions Cowbirds are raised without loss to the Song Sparrow young that are present; hence this early drought must have caused a lack of insect food that resulted in the death of the eighteen young Song Sparrows.

The Cowbird. In 1930 the percentage of nests of the first two broods parasitized by *Molothrus ater ater* was 28; in 1931, 25; but in 1932, 58! Nests with two Cowbird eggs have amounted to one third, one fifth, and one fourth of the total number of nests parasitized in the three years respectively.

In fifty-six successful nests without Cowbirds 3.4 Song Sparrows apiece were raised, while in twenty-one with Cowbirds 2.2 Song Sparrows each were raised, a difference of 1.2 Song Sparrows between the parasitized and non-parasitized nests. Multiplying 1.2 by the 21 nests, we get 25, which happens to be the exact number of Cowbirds raised in these nests. This looks as if each Cowbird were raised at the expense of one Song Sparrow, and this, counting the eggs eaten by the adult, may be near the truth. The Cowbird in my experience has eaten or removed a Song Sparrow egg in one fifth to one fourth of the nests in which she has laid.

Returning to Table VI, if we add 11 starved young to the other sins of *Molothrus*, we get a 29 egg-and-young loss of the 585 eggs, or 5 per cent. Eight of the 13 eaten eggs were in nests that raised young successfully, and the same was true of 14 of the starved and crushed young. If these had survived, the total would have reached twenty-two. If we add either 22 or 25 to the 243 young that were fledged, we get an 8 to 9 per cent loss of fledged young due to Cowbird activity.

In normal seasons the Song Sparrows are able, as a rule, to raise one Cowbird and all of their own young that hatch, one pair even bringing up five of their own besides the boarder. But if there are two Cowbird eggs in one nest, this feat becomes impossible. One Song Sparrow pair raised one of their own young besides the two parasites, and another pair actually raised two of their own under this handicap.

CONCLUSIONS

To return to our opening paragraph: there has been about a 12 per cent net loss of adult males and 20 per cent loss of females each year during the first half of the three nesting seasons; hence four fifths of the birds must raise enough young to replenish the whole population.

The first egg has been laid as early as April 10th; normally it appears the middle of April, but in 1932 it was delayed until the 23d. Although beginning at such different times, only once, so far as I know, has the nesting season been cut short in midsummer, and that was due to the great drought in 1930.

There has been plenty of food available for the young, except in late May and in June, 1932, during an early drought.

Parent Song Sparrows, as a rule, are proficient, even when both birds of a pair have been hatched the previous year.

Heavy rains have caused losses during 1929 and 1933, but not during the three intervening years, while I was here.

As a result of nearly five years' study of the Song Sparrows nesting on Interpont, I find that the loss of the total number of eggs laid can be apportioned somewhat as follows: predators account for about 36 per cent, parental inefficiency (including sterile and addled eggs) 8 per cent; the Cowbird, 5 per cent; man (cultivation, robbery, shooting), 5 per cent; and the weather, either lack of rain or too much of it, 5 per cent.

During the past four years there have been two favorable nesting seasons and two unfavorable ones. 1930 was successful for three months, but apparently four full months of nesting activity are necessary if Song Sparrows are going to raise enough young to offset adult losses. During 1932 the birds, hampered by the disastrous early drought and heavy Cowbird parasitism, raised a fifth fewer young than they should have done during the first half of the season.

In 1930 and 1932 Interpont was full of Song Sparrows, and among the resident males the proportion of young birds in the population was 43 and 50 per cent respectively. But in 1931 and 1933 there were many vacant territories, and the proportion of juvenile resident males was 33 and 38 per cent respectively, while the proportion of juveniles in the total number of breeding males, both resident and summer resident, was only 25 per cent in April, 1933.

Some winters are more favorable than others to Song Sparrow survival, and this factor, of course, influences the numbers of breeding birds present the following spring. But I

believe the nesting seasons are of even greater importance in determining the size of the breeding population year by year.

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STATE DISTRIBUTION OF RETURNS FROM BANDED DUCKS

Fourth Paper: Montana, Nebraska, New Jersey, New York, North Dakota, Ontario, and Oregon.[1]

By FREDERICK C. LINCOLN

THE present paper is the fourth in a series intended to acquaint bird-students, sportsmen, conservation officials, and others with the information that is being obtained by the Biological Survey relative to the movements of migratory waterfowl through the banding of such birds at various points throughout the Continent. Technical reports that will discuss the distribution and migration of the different species are contemplated for future publication.

The accompanying maps show as a circumscribed area where the banding has been done in the different States and Provinces. In some cases the number of local recoveries is indicated within the circumscribed region. From that point lines lead to the various States and Provinces where the banded ducks have been retaken. The terminals of the lines do not show exact points of recovery, and the numbers are the totals for all return records regardless of the species, the status of each generally being noted in the accompanying statement. The data included in this study have been compiled to July 1, 1932.

While experience has shown that on the average about one half of the total returns from any lot of banded ducks will be received during the first shooting season succeeding banding,[2] the number of these first-season returns will be influenced by several factors. For example, the number of first-season returns will be greater for a lot of birds banded just before or during the early part of the shooting season than for a similar number banded in the same area immediately after its close. Moreover, the data obtained in these two cases have different applications to migration routes. To illustrate, it is evident that the southward flight of ducks banded in North Dakota before the opening of the shooting season is clearly defined by the return records received from all points during or immedi-

[1] First paper: *Bird-Banding*, Vol. III, pp. 140–142, Oct., 1932.
Second paper: *Bird-Banding*, Vol. IV, pp. 19–32, Jan., 1933.
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[2] Lincoln, Frederick C. Calculating Waterfowl Abundance on the Basis of Banding Returns. Circ. 118, U. S. Dept. of Agriculture, May, 1930.

ately after the close of *that* season. But had these birds been banded during the northward flight in spring, those shot in the succeeding autumn and winter would in the mean time have gone north to some unknown breeding ground. It will be obvious, therefore, that when a round trip either north or south has been made during the time between banding and recovery, the actual course followed by the bird cannot be shown diagrammatically. This explanation is given here to correct any misunderstanding that may exist relative to the maps here included or which were presented in the three preceding papers.

Return data from the following States and Provinces have been already considered: Alberta (first paper); British Columbia, California, Connecticut, Georgia, Illinois, Iowa, and Kansas (second paper); and Louisiana Maine, Massachusetts, Michigan, Minnesota, and Missouri (third paper). The present account discusses return records received from ducks banded in Montana, Nebraska, New Jersey, New York, North Dakota, Ontario, and Oregon.

MONTANA

Starting in the autumn of 1926 and continuing each season to 1930, former Reservation Protector Frank H. Rose banded a total of 14,009 ducks at the National Bison Range, near Moiese, Montana. Of these birds, 13,882 were Mallards, the remainder being Pintails, 101; Green-winged Teals, 9; and Shovellers, 4.

During the period from 1927 to 1930, United States Game Protector George E. Mushbach[3] banded 172 ducks in Yellowstone, Cascade, and Lake Counties. The species represented were the Mallard, Gadwall, Baldpate, Green-winged Teal, Blue-winged Teal, Shoveller, and Pintail.

The grand total for the State is, therefore, 14,181, from which 2,781 return records have been obtained. Of these, 2,728 are for the Mallard, 35 are for the Pintail, and the others are scattered among four other species.

Reference to the map (Fig. 1) reveals an interesting situation. Since the banding area is not in an important wintering or breeding region, it must be considered as a resting and feeding point that is visited during migration. While some of the birds may have bred locally, it seems likely that the principal breeding grounds are located in Alberta and Saskatche-

[3] Mr. Mushbach is now Superintendent of the Bear River Migratory Bird Refuge in Utah.

Figure 1. Distribution of Returns from Ducks Banded in Montana.

wan, to a lesser extent in British Columbia, and northward to Mackenzie and Alaska. From these regions many birds pass through western Montana to two distinct wintering areas, the more important being in the northwestern part of the United States, while the other is on the Gulf Coast of Texas and Louisiana.

As the banding was done almost entirely during the open shooting season the large number of local returns from Montana and the adjoining parts of northern Idaho cannot be considered unusual. The many records from Washington and Oregon do, however, show a heavy concentration in that region during the winter. (See also account under British Columbia, *Bird-Banding*, Vol. IV, pp. 19–21, January, 1933.) The principal flight from western Montana, accordingly, must be in a westerly direction with a fairly large percentage of the birds then making a left turn and continuing southward into Nevada and California.

Another contingent fly to the southeastward and upon reaching the Great Plains probably spread out and mingle with the flocks that are traveling southward over that flyway. It appears that most of these birds follow a route across Wyoming, Colorado, and Oklahoma, to Texas and Louisiana.

The two easternmost records are both for Mallards, as follows: No. 595,727, banded on November 13, 1927, was killed at La Fontaine, Wabash County, Indiana, on November 16, 1929; and No. 597,829, banded on September 20, 1928, was killed at South Portland, Maine, about December 26, 1928. This last case is a most unusual record. Both of the ducks recovered in Mexico were Pintails.

NEBRASKA

Two waterfowl-banding stations in Nebraska have operated persistently. At Antioch, F. J. Keller started banding in 1925. Practically all of the 264 Mallards he has banded have been hand-reared. A. R. Golay, at Kearney, began trapping and banding in August, 1927. He has reported 130 birds, as follows: Mallard, 7; Baldpate, 8; Green-winged Teal, 6; Blue-winged Teal, 61; Shoveller, 1; Pintail, 47.

From this total of 394 banded ducks, 53 return records have been obtained, of which 49 are for the Mallard, with two each for the Pintail and the Blue-winged Teal.

These data are scarcely sufficient for general conclusions, but as shown by the map (Fig. 2) some interesting information has resulted. In the case of the 19 records for Nebraska it

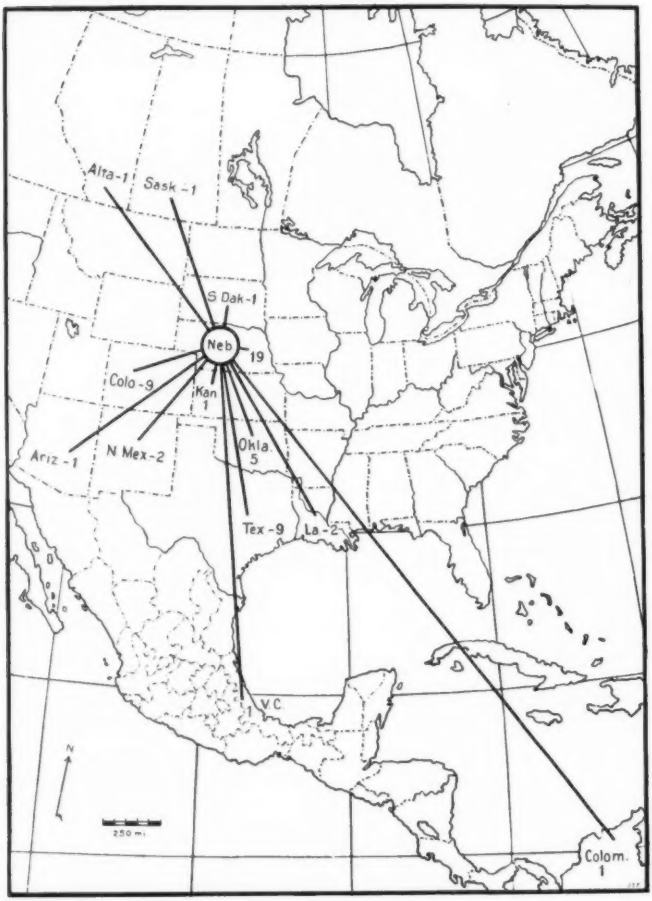

Figure 2. Distribution of Returns from Ducks Banded in Nebraska.

should be explained that many of these are "live retraps" by Mr. Keller. Several ducks banded by him have returned and have been recaptured at his station in succeeding seasons. One of these, female Mallard 555414, banded on November 29, 1927, has returned for six successive seasons and nested in a box on the roof of a shed at the station. Her offspring have been killed north to Canada, west to Arizona, and south to Louisiana and Texas, but each year she has escaped and returned to nest in her unusual site.

A Pintail banded at Kearney was recovered in Vera Cruz, Mexico, while a Blue-winged Teal, 363850, from this same station, was recaptured in Santa Marta, Colombia. It was banded on April 13, 1927, and killed on October 15, 1927. This record represents the only banded duck that has been recovered from South America.

NEW JERSEY

Banding work with waterfowl in New Jersey has been limited to one station operated by Ephraim C. Smith, on the Dupont Experimental Game Farm, at Carney's Point. During three seasons, starting in the autumn of 1929, 757 ducks were banded, all being Black Ducks, except for 36 Mallards, and 3 Pintails.

The 53 returns obtained, all for the Black Duck, add further to our knowledge of the movements along the Atlantic Coast of this important species (Fig. 3).

The Black Duck breeds throughout the coastal marshes from North Carolina northward, so it is not surprising to find that migratory flights from any particular area on the Atlantic coast are limited to a relatively small number of individuals. This is particularly true when the breeding region also is suitable for winter quarters. The New Jersey records do, however, indicate a certain amount of migration, and the hypothesis may be raised that the ducks banded at Carney's Point included local birds with a small number of individuals from more northern regions as Maine, Ontario, and Quebec, which, after banding, continued on down the coast to preferred winter quarters in Virginia and North Carolina. More extensive banding of Black Ducks at additional stations must be done before such theories may be definitely proved or disproved.

NEW YORK

Dr. Arthur A. Allen, Professor of Ornithology, Cornell University, started banding migratory waterfowl at Cayuga Lake during the period of activity of the old American Bird-Banding

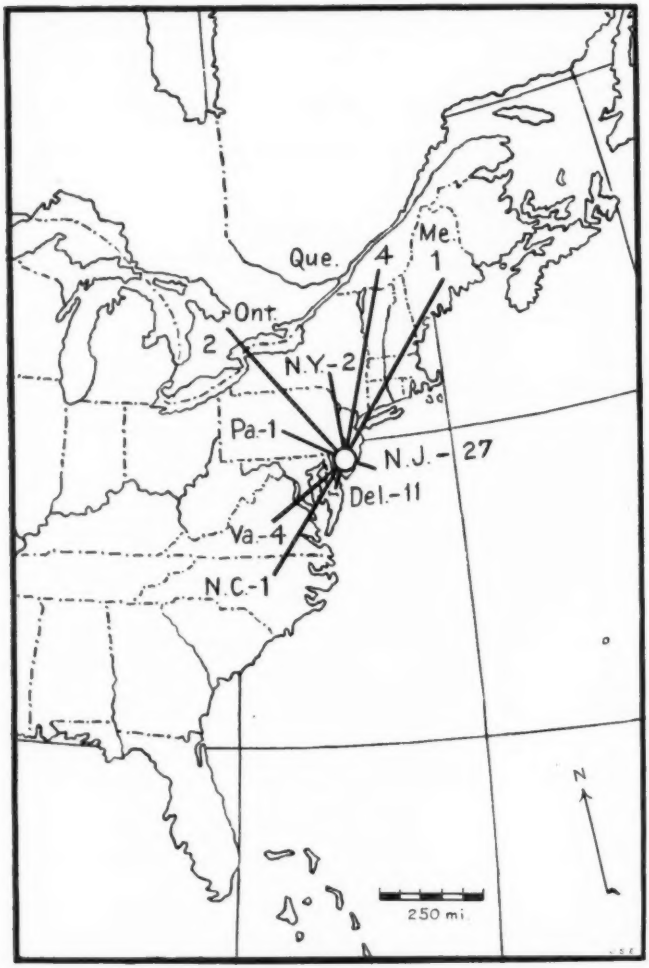

Figure 3. Distribution of Returns from Ducks Banded in New Jersey.

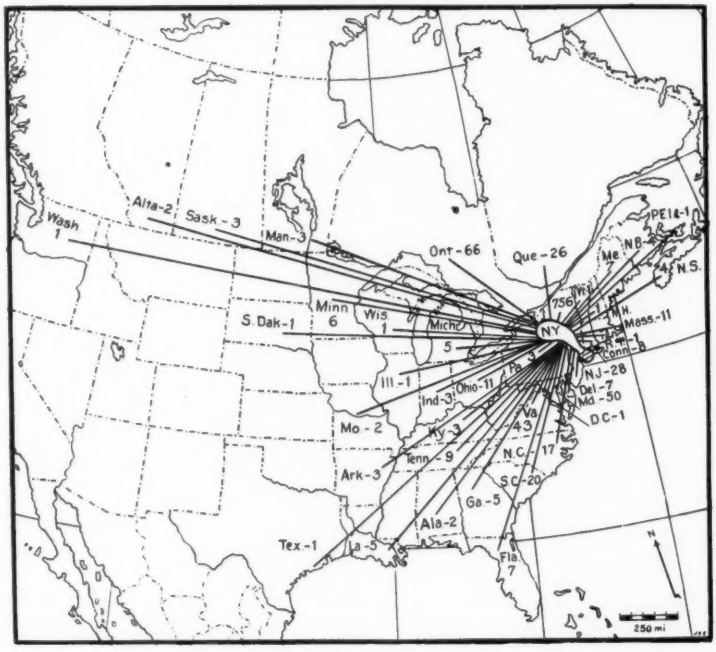

Figure 4. Distribution of Returns from Ducks Banded in New York.

Association. With the assistance of some of his students the work was continued under the Biological Survey. He is credited with 812 birds, chiefly Mallards, Black Ducks, Greater Scaups, and Redheads.

In the spring of 1924, Charles R. Weinberger started a station on the property of the Southside Sportsmen's Club, at Oakdale, Long Island. Since 1927 banding at this point has been continued by Alvah G. Allen. The number of ducks banded is 525, of which 418 were Black Ducks, the others being chiefly Mallards and Wood Ducks.

Starting operations at Southampton, Long Island, in the autumn of 1927, Charles J. Mercer banded 1,589 ducks up to the spring of 1931. These also were mostly Black Ducks, although 231 Mallards were included.

The latest waterfowl banding station to operate in New York is one at Rochester, N. Y., in charge of Dr. W. Bruce Large. Dr. Large started work in the autumn of 1927 and has continued during each successive season. His total as here considered is 3,087, divided by species as follows: 2,647 Black Ducks; 241 Mallards; 13 Gadwalls; 53 Baldpates (Widgeons); 31 Pintails; and 2 Wood Ducks.

The grand total of banded ducks for the State of New York is 6,013 from which 1,129 return records are available for the present study.

The map (Fig. 4) further illustrates the localization that affects the Black Duck, although in the present instance the large number of local recoveries is partly explained by banded birds retrapped at Rochester by Dr. Large. While undoubtedly some of the ducks banded in New York were local breeders, the evidence indicates that the major breeding area is located in Ontario and Quebec, and, to a smaller extent, in New England and the Maritime Provinces of Canada. Twenty-five of the records from Quebec are for the Black Duck, while 58 of those from Ontario are also for this species. There is, however, a well defined migratory flight along the south Atlantic Coastal region, which is clearly shown by the relatively large number of returns reported from all States south of, and including, New Jersey.

A smaller flight appears to move southwestward along the southern shore of Lake Erie, and thence across to the Mississippi Valley, which appears to be reached in the region of the mouth of the Ohio River.

The single return record for the State of Washington is of a Greater Scaup (204206) banded at Cayuga Lake, New York, on February 27, 1923, and killed at Big Lake, Washington, on December 7, 1927.

NORTH DAKOTA

During the autumn of 1929 the author started a waterfowl-banding station at the private shooting preserve of Colonel George T. Slade, near Dawson, North Dakota. Through Colonel Slade's interest this station has continued in operation under the personal direction of L. C. Pettibone. The total number of birds banded is 1,913, in which the Pintail and the Mallard represent more than half, the balance being Baldpates (32), Redheads (110), Lesser Scaups (7), Green-winged Teals (4), Blue-winged Teals (17), Gadwalls (5), Ruddy (1), Shovellers (2), and Black Ducks (2). A total of 479 return records have been obtained from the banding work at this station.

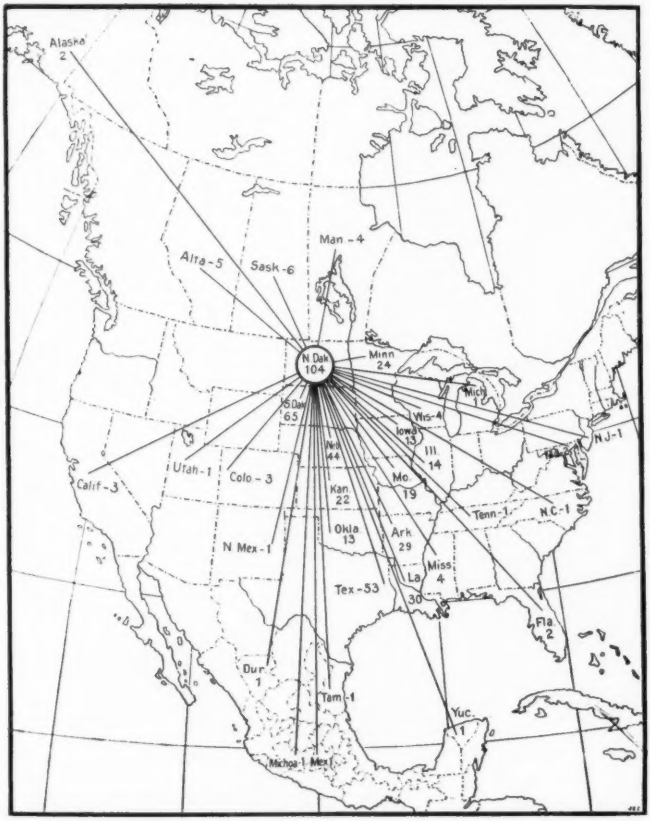

Figure 5. Distribution of Returns from Ducks Banded in North Dakota.

North Dakota (See Fig. 5) lies near the middle part of the broad arterial flyway that extends across the Great Plains from Canada to the Gulf Coast, and that is bounded on the west by the Rocky Mountains, while on the east it merges with the narrower boulevard traversing the Mississippi Valley. In

addition to the birds that nest locally, the great breeding grounds of Canada furnish many of the birds that pass through this region, the bulk of which continue their course almost directly south to Texas and Louisiana. Most of these birds are Mallards and Pintails, but included with them are many Shovellers, Widgeons, Teals, and Redheads. It seems probable that the Redheads using this route are the only ones of their species that make a direct southerly flight from breeding grounds to winter quarters, the other routes followed by this species being either to the southeast or the southwest. At least a few Redheads from this region join the southeastern flight, which is indicated by the record for A-647,771, banded on September 13, 1929, and killed on the Delaware River, New Jersey, on November 4, 1929. One of the returns from Maryland and the one from North Carolina, also are for Redheads.

Both of the Alaskan records, the three from California, the two from Florida, and all of those from Mexico, are for Pintails, further illustrating the extensive range of this species. One of the records from Alaska, also is indicative of the speed of the northward migration. This bird, A-649,671, was banded on April 19, 1931, and was recaptured at Selawik, Alaska, on May 30, 1931.

ONTARIO

When the Biological Survey took over the banding work in 1920 the largest waterfowl-banding station on the continent was the one operated at Lake Scugog, Ontario, by H. S. Osler, of Toronto. For several years Mr. Osler had been banding ducks with bands of the old American Bird-Banding Association. Work at this point was continued each season to the autumn of 1926. The total number of ducks banded was 5,047. Most of these were Black Ducks, but each season a few Mallards, Greater and Lesser Scaups, Ring-necks, Redheads, and Green-winged and Blue-winged Teals, were banded. From these operations, 1,228 return records have been obtained. The Black Duck is represented by 1,014 records, the Mallard by 76, the Lesser Scaup by 68, the Blue-winged Teal by 51, the Ring-neck by 14, the Green-winged Teal by 3, and the Redhead and the Greater Scaup by one each.

As is shown by the map (Fig. 6) the data here considered permit an excellent diagnosis of the southward migration. The lakes and marshes of lower Ontario constitute an important concentration area for ducks, most of which apparently breed in that Province and adjoining parts of Quebec and Manitoba.

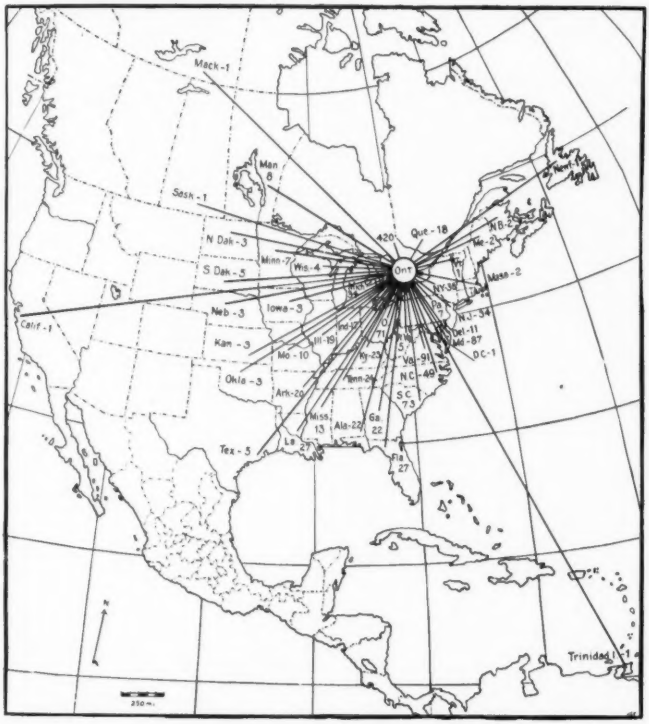

Figure 6. Distribution of Returns from Ducks Banded in Ontario.

The conformation of the land-mass is such that when the southward movement is started, the flocks travel southwestwardly to the St. Clair Flats, between Michigan and Ontario, thence across to the south shore of Lake Erie. Here the route divides, one contingent continuing the southwestern course across Indiana and Illinois to the Mississippi River and then south to the lower parts of the valley. The other flocks, which are much larger, work eastward along the marshes of the south shore of Lake Erie, and probably to some extent Lake Ontario, large numbers remaining in this region until forced by climatic conditions to move out. A cross-country flight is then made

to the Atlantic Coast which is reached in the general vicinity of Delaware and Chesapeake Bays. The birds then drift southward as far as Florida, many remaining to winter in Maryland, Virginia, and the Carolinas.

In succeeding seasons it appears that some birds follow other routes, which explains the return records in the Great Plains region and on the northeastern coast.

The record farthest north is that of a Mallard (323,904), banded on September 27, 1925, and recovered at a point fifty miles north of Fort McPherson, Mackenzie, during the spring of 1926. The record from Newfoundland is for a Black Duck (296,195) recovered four years after banding.

The records from California and the Island of Trinidad, British West Indies, are both for Blue-winged Teal. The California bird (323,756), was banded on September 24, 1925, and killed at Burlingame on December 12, 1926, while the one reported from Trinidad (4576) was banded on September 24, 1920, and killed near Port of Spain on December 9, 1920.

OREGON

Banding of waterfowl in Oregon was begun in the autumn of 1923, when S. M. Batterson started a station at Mohler. Operations at this point have been continuous each season, 1,690 birds having been marked. Most of these have been Scaups, with fair numbers of Pintails and Canvas-backs.

At the Lake Malheur Migratory Bird Refuge, near Voltage, Oregon, U. S. Reservation Protector George M. Benson, started banding operations in January, 1926. This work has been continued with each succeeding season to the extent that a total of 6,536 birds have been banded. Of these the Mallard leads with 2,372, followed by the Baldpate (Widgeon) with 1,851, the Pintail with 696, the Gadwall with 490, the Green-winged Teal with 649, the Canvas-back with 81, the Cinnamon Teal with 30, the Redhead with 24, the Lesser Scaup with 12, the Shoveller with 6, the Golden-eye with 2, and the Black Duck and Wood Duck with one each. Banding records from this station also include 60 Canada Geese, 45 Whistling Swans, and a few herons and ibises.

In the autumn of 1928, George J. Bills started a waterfowl-banding station at Sauvies Island, near Linnton, Oregon, and continued the work in the autumn of 1931. The birds banded number 266, and were mostly Mallards with a few Pintails and Baldpates.

Hugh M. Worcester, Deputy U. S. Reservation Protector,

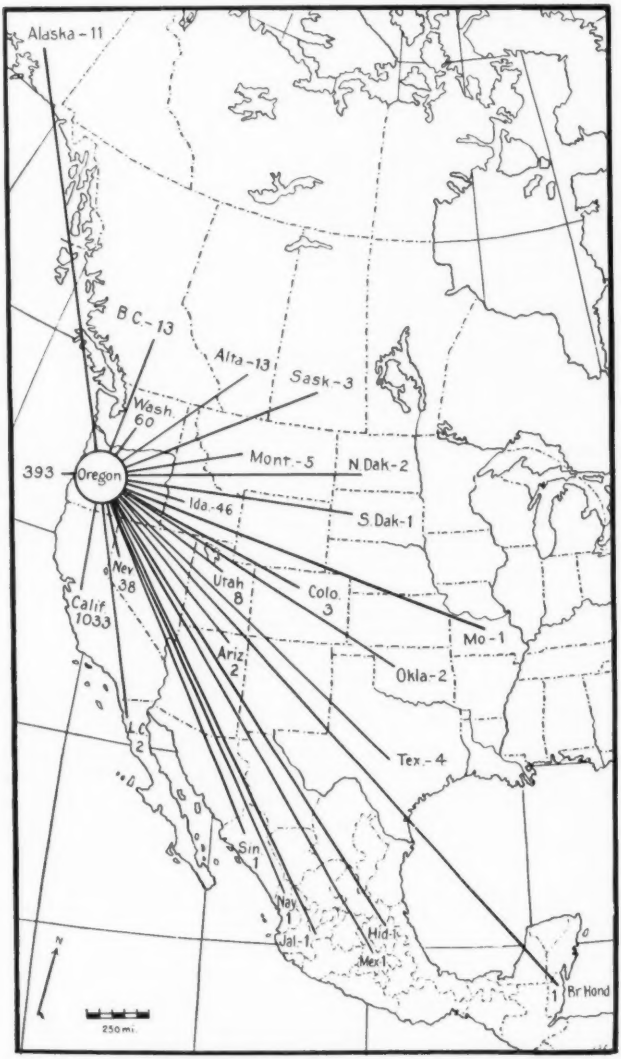

Figure 7. Distribution of Returns from Ducks Banded in Oregon.

started banding at Tule Lake Migratory Bird Refuge in 1931, banding 59 Mallards, Pintails, Gadwalls, and Baldpates. He also marked 33 Cackling Geese, 6 Snow Geese, and 3 Whistling Swans.

In the autumn of 1927, Charles C. Sperry of the Biological Survey banded a few Pintails and other ducks during the course of other investigational work at Klamath Lake.

The total number of ducks banded in Oregon and here considered is 8,446, from which 1,646 return records have been obtained. These are distributed among the different species as follows: Mallard, 614; Gadwall, 80; Baldpate, 448; Pintail, 219; Green-winged Teal, 146; Cinnamon Teal, 2; Shoveller, 5; Redhead, 4; Lesser Scaup, 101; and Canvas-back, 27.

The large number of local recoveries indicated on the map (Fig. 7) suggests much localization, although this is partly due to the banding's having been done during the shooting season. Nevertheless, there is an important southward movement through this State, a large number of the birds coming from the interior, as was shown in the discussion under Montana. The valleys of California are the winter quarters selected, and it is in this region that the majority of the Mallards (342), Gadwalls (41), Baldpates (375), Pintails (126), and Green-winged Teals (122), were recovered. In addition to local breeding grounds, including those in States adjoining that of banding, important breeding areas are indicated in Alberta, British Columbia, and Alaska. No Mallards banded in Oregon have been recovered in Alaska, the records from that Territory being for Baldpates (1), Pintails (3), and Lesser Scaup (7).

It will be noted that several records have been received from points south of the United States, chiefly from western Mexico. These all are for Pintails except for one Cinnamon Teal recovered in Nayarit. The southernmost return also is for a Pintail, 227,609, banded on September 5, 1927, and killed at Belize, British Honduras, on December 23, 1927.

Biological Survey, Washington, D. C.

SOME ORNITHOLOGICAL EXPERIENCES IN EUROPE

By MARGARET MORSE NICE

THE occasion of our family's journey to Europe in 1932 was the International Physiological Congress, which met at Rome the last of August; moreover, we wished to give our daughters a comprehensive trip from the sight-seeing and educational point of view; hence birds were not by any means the first consideration. Any one hoping to do much with birds should go over earlier in the season than we did—we landed June 25th—and not spend much time in cities. I was handicapped at first by having no book but one for English birds[1] and that of uneven value; in some cases the pictures were good, in others misleading, besides which several species occurring in France were not mentioned at all. In Paris and Berlin I had the assistance of ornithologists, but the rest of the time I puzzled out the birds as best I could by myself, greatly helped later by an excellent set of German books.[2]

One delightful feature of Europe is the close association of many of the birds with human dwellings and cathedrals; there are Swifts (*Apus apus*), Swallows (*Hirundo rustica rustica*), Martins (*Delichon urbica urbica*), and Jackdaws (*Colœus monedula spermologus*), not to mention the ever-present House Sparrows (*Passer d. domesticus*) and common Pigeons. The Swifts are larger than ours, and their note is entirely different, a kind of sucked-in whistle, *ssee, ssee,* heard especially in the evenings when small companies dash madly hither and yon above the roofs. The Swallow, nearly related to our Barn Swallow, and the Martin were found everywhere. The latter built retort-shaped nests under the eaves of houses and were still nesting under the archways September 13th in Kings' College at Cambridge. Jackdaws frequent the towers of almost all the old churches and are most amusing with their screams, chuckles, and queer shouts.

July 1st, spent in the country in Brittany near St. Malo, was richly rewarding. Yellowhammers (*Emberiza citrinella*) sang by the roadside, while Magpies (*Pica pica*) were common in the fields and a gorgeous great Green Woodpecker (*Picus viridis*)

[1] Sanders, E. A Bird Book for the Pocket. Oxford Univ. Press. 1927. 245 pp.
[2] Fehringer, O. Vögel Mitteleuropas. 3 vols. Heidelberg. Winters. 1931.

sat on the trunk of an apple tree. In the hedges we met Whitethroats (*Sylvia communis*), whose jumbled refrains reminded me of our own Bell's Vireo (*Vireo belli belli*). In the woods we heard our first Chiffchaff (*Phylloscopus collybita*), whose song quite intrigued us at the first hearing, but before long began to be extremely monotonous. Here we met whole processions of Tits; Marsh Tits (*Parus palustris*),[1] very much like our Chickadee (*Penthestes atricapillus*); the engaging Crested Tits; (*Parus cristatus*), the gay little Blue Tit (*Parus cæruleus*), and the charming little Long-tailed Tit (*Ægithalos caudatus*). Later we often met the Great Titmouse (*Parus major*). There are far more kinds of Titmice in Europe than in America. In the fields the Skylarks (*Alauda arvensis*) were singing a prolonged, rapid, jumbled ecstatic song. I can see how Europeans could become much attached to it, but to me, after Shelley's poem, it was a sore disappointment. It was too late to hear the Nightingale (*Luscinia megarhyncha*) at its best; I described its song in my note-book as "bubbling, warbling, joyous."

In Paris the Muséum d'Histoire Naturelle is planned according to artistic principles, the room of European birds being arranged with all the large birds at the bottom and small ones near the ceiling, where it is impossible for the laity to see them, the entrance to the gallery being reserved "seulement pour les professeurs." There seems to be little popular interest in birds in France; although I asked at countless stores for bird books, I could discover nothing in the way of a pocket guide, the only books offered me being M. Delamain's charming volumes of essays "Pourquoi les Oiseaux Chantent" (crowned by the French Academy) and "Les Nuits et les Jours des Oiseaux." The author is doing fine educational work with his series "Livres de Nature," which are mostly translations of American, English, and German books.

One Sunday, Dr. Hans Scharnke (a pupil of Dr. Stresemann), who is doing research in L'Ecole Normale Supérieure in Paris, conducted us on a trip to St. Germain-en-Laye. After all my lone efforts to learn the birds, it was both revealing and satisfying to have an ornithologist to tell us the author of every song, to corroborate or correct my own identifications, and to name each new bird. Dr. Scharnke showed us our first Tree Sparrow (*Passer montanus*) much like *Passer domesticus* except

[1] The generic names in general use in Europe sometimes differ from those adopted by the A. O. U. for the same genera, so that a difference in generic names between allied species in the United States and abroad does not necessarily imply an actual generic distribution. —EDITORS.

for its brown head, and explained about the two Redstarts, the Common (*Phœnicurus p. phœnicurus*) and the Black (*P. ochruros gibraltariensis*) only the first of which had been in my book. We heard the delightful song of the Redbreast (*Erithacus rubecula*), and the beautiful refrain of the Blackcap (*Sylvia atricapilla*). The fat Wren (*Troglodytes t. troglodytes*) has a long and pretty song. But the chief singer was the Chaffinch (*Fringilla cælebs*); we found this handsome bird everywhere throughout our trip, as friendly as could be in parks, and on the mountain-sides in the Tyrol.

On July 18th, leaving my family to take the Rhine trip and explore southwestern Germany, I started for Berlin, spending a night at Cologne. In the Zoo there they have a most ingenious scheme of Habitat Groups of Living Birds, native except in a few cages of Birds of the High Alps, etc. There were Birds of the Woods, of the Fields, of the Garden, of the Edge of the Woods, of the Swamps, of Coniferous Forests, etc., each cage with appropriate environment and colored pictures of each bird with German and scientific name and a brief statement as to range. These exhibits were very helpful to me and must be of high educational value to other visitors.

In Berlin I met a most kind and cordial welcome from the ornithologists, and all of Dr. Stresemann's wonderful array of books and journals was placed freely at my disposal. Dr. Ernst Mayr of the American Museum of Natural History, to whom I am largely indebted for my introduction to European ornithology and ornithologists, took me to visit Herr Gottfried Schiermann, who has done notable life-history studies on the birds near Berlin.

One of Dr. Stresemann's students, Georg Steinbacher, son of the ornithologist Friedrich Steinbacher, took me on two trips. The most interesting birds in all Germany live within a short distance of the third largest city in the world, but it was too late in the season to see most of them. Berlin owns immense stretches of woodland, all planted forests, each portion having trees of one age, the chief tree being the Scotch pine (*Pinus sylvestris*), very beautiful with its reddish bark and irregular branching. On July 21st we went to Friedrichshagen, where ten pairs of Swallows were nesting in the railway station; in the woods I saw for the first time the attractive little Red-backed shrike (*Lanius collurio*), and Herr Steinbacher frightened a Stock Dove (*Columba œnas*) from a Black Woodpecker's (*Dryocopus martius*) hole, later hearing the cry of this splendid bird in the distance. Woodpeckers are much less

common in the parts of Europe I visited than in our country—an observation that has been made by other Americans. The most thrilling sight was that of a pair of Hobbies (*Falco subbuteo*), handsomely marked little falcons and among the fastest-known flying birds; to the accompaniment of much screaming the female met her mate and snatched from his claws the prey he carried.

Four days later we went to Finkenkrug, a half-hour's ride on electric railroad, where we found ourselves again in extensive woods, but this time there were deciduous trees and undergrowth and ripe red raspberries besides the pines. Here I saw my first Golden Oriole (*Oriolus oriolus*), Whinchat (*Saxicola rubetra*), Corn Bunting (*Emberiza calandra*), Heron (*Ardea cinerea*), and others. After sunset a number of the small roe deer appeared and gave their curious loud barking cries. But the great excitement of the day, and, indeed, of the whole European trip, was the sight of five Great Bustards (*Otis tarda tarda*). The immense birds, with their long white necks and brown speckled backs, walked slowly over the mown meadow, dwarfing a Common Buzzard (*Buteo b. buteo*) that perched near. As we approached, they flew, giving a most striking display of the white in their brown wings.

Raptores are astonishingly common, according to our ideas, in the vicinity of Berlin, and there are even a few pairs of the Sea Eagle (*Haliaëtus albicilla*) and the Spotted Eagle (*Aquila pomarina*). Herr Schiermann found in a tract of deep woods of about nine square miles the nests of eight pairs of owls, twenty-four nests of hawks of six species, ten pairs of Storks of two species, and five pairs of Cranes—a total of forty-seven pairs of large birds of ten species. All birds of prey are strictly protected except the Goshawk (*Accipiter gentilis*) and the Sparrow Hawk (*Accipiter nisus*).

Dr. Oskar Heinroth showed me the Berlin Zoo one morning and the Aquarium another. It was a great disappointment to me that Frau Heinroth was in Rumania and also that this season for the first time in thirty years no young birds were being raised. For the Heinroths have done the most extraordinarily interesting and important researches, having brought up from the egg or early babyhood hundreds of different species, making careful studies on the growth, development, and psychology of the young birds. Everywhere in European ornithological literature one finds the Heinroths quoted as the authorities on life-history questions. It was a shock, to learn after my return home that Magdalena Heinroth had died in

August—an irreparable loss to her friends and to ornithology.

Among the most interesting features of the Zoo to me were the Monk Paroquets (*Myiopsitta monachus*), natives of Brazil, which live in perfect freedom outdoors the year round, nesting in an enormous colony nest and flying hither and yon shrilly screaming. In one of the bird-houses there is a large cage filled with gaily colored Weaver-birds of different kinds; it is a fascinating sight to see the males building elaborate woven nests.

Even more interesting to me than the Zoo was the Aquarium, of which Dr. Heinroth is Director. Without exception this is the most remarkable collection of living creatures I have ever seen. The first floor is equally divided between marine and freshwater creatures, while upstairs are terraria for reptiles, amphibia, and even spiders and insects. The beauty of some, the strangeness of others, and the extraordinary interest of practically every exhibit made the Aquarium a fascination. Everything is most clearly labelled with pictures, German and scientific names, ranges, and often a brief statement as to habits. Here, as in the Zoo, there are beautiful postcards, as well as small illustrated guides, sold for a few cents to adults and given free to children.

In the Zoologisches Museum three floors are devoted to study collections and only the ground floor to exhibitions. Yet the matter of educating the public is given careful attention. For instance, the museum is open one evening a week for the benefit of working people.

One's first impression of the cases is the absence of crowding. The native birds were arranged in a very instructive way: specimens of male and female and a nest, with labels telling the status of the bird as resident or otherwise, migration dates with transients and summer residents, and nesting dates with the breeders. In other cases were eggs of all the species.

The large room devoted to Biology particularly interested me. Here were illustrated with examples chosen throughout the animal kingdom—Protective Devices, Reproduction, Social Instincts, Effects of Environment, Food, etc., etc., each subject worked out in striking and remarkable detail. All in all, it was a fascinating place that would well repay many days of study.

The French arrange their specimens to form a beautiful picture; we make a show that arrests the attention and, we hope, will inform the spectator; but the Germans deliberately plan to teach and use every pedagogical means to make the

visitor think, to set the animal before him as a problem. In their zoölogical gardens that I visited, the Aquarium, and the Zoologisches Museum, everywhere are evident their abhorrence of superficiality, their determination to get down to reality, their passion for truth.

During our three days in Switzerland the most interesting birds seen were on the Zurichsee and Vierwaldstättersee and on Pilatus. On the lakes were many Black-headed Gulls (*Larus ridibundus*), at this season minus any black; a few Coots (*Fulica atra atra*), and quite a number of Great Crested Grebes (*Podiceps cristatus*). Kestrels (*Falco tinnunculus*)—much like our Sparrow Hawk—and Buzzards were noted from the train, and a Black Kite (*Milvus migrans*) was seen near Luzern.

On August 7th we took the funicular to Pilatus-Kulm near Luzern—an hour's ride from a level of twelve hundred to nearly seven thousand feet, through the beech woods, through the spruces, and finally above tree-line. Here we were delighted to find a large number of the Alpine Choughs (*Pyrrhocorax graculus*) sailing and diving and circling as gracefully as gulls following a ship. With their strange screams, which suited the wildness of the crags, and the marvel of their flight, they gave the finishing touch to the wonderful scene. They are very tame, coming within a few feet of people in hopes of crumbs, their red feet and legs and yellow bills contrasting strongly with their glossy black plumage.

The other birds on the mountain-top were a Black Redstart, a pair of Ravens (*Corvus corax*), and a pair of Snow Finches (*Montifringilla nivalis*) that were feeding their noisy young in a crevice in the rocks.

The following day we visited Herr and Frau Josef Bussmann to see the terragraph and to talk birds. Besides his researches with this instrument,[3] Herr Bussmann has done a great deal for bird-protection, and is a zealous bird-bander, last year ringing twelve hundred birds, among them large numbers of nestling Black-headed Gulls and migrating Starlings (*Sturnus vulgaris*) that are caught with nets as they roost in the reeds.

Swiss Banders have seven sizes of rings from "Kleinvögel" to Eagles, but they do not have as many sizes for the smaller species as we do—only one ring for birds smaller than a Starling. On the cards announcing recoveries, the "Vogelwarte" at Sempach gives the direction and distance of the

[3] See Bird-Banding, 1933, vol. 4, pp. 33–40.

locality where the bird was found from the place of banding.

Of the birds of prey in Switzerland only the Sparrow Hawk (*Accipiter nisus*), Goshawk (*Accipiter gentilis*), and Peregrine Falcon (*Falco p. peregrinus*) can be killed. Formerly bounties were paid for these three species, but this scheme was abandoned, since, as elsewhere, they discovered that useful species were being killed and paid for.

In Italy we had the pleasure of meeting a new subspecies of House Sparrow with a brown head and a slightly different *yap* from that with which we are so familiar. Italian House Sparrows (*Passer domesticus italiae*) are not as common in the cities as *Passer domesticus domesticus* farther north, nor so tame.

Characteristically enough the first bird book offered me was on the native birds suitable for captivity (and even Titmice are included); it is, nevertheless, a charming book in its wealth of quoted poems treating of many of the species, mostly in Italian, but a few in Latin and French.[4] It gives the good news that blinding of birds is no longer permitted, nor the taking of nestlings to rear for cage-birds. Later I found a pretty good handbook[5] with colored illustrations for $1.50. The far-famed Naples Aquarium was a disappointment after that of Berlin; they have only sea forms from the Bay of Naples. There is not a single label in the whole establishment; any one who wishes to be intelligent about the exhibits must buy a guide (published in various languages) for 50 cents.

In the Colosseum at Rome there lived Jackdaws, a little Scops Owl (*Otus scops*) and a most interesting bird, the *Passera Solitaria*, or Blue Thrush (*Monticola solitarius*). These birds frequent mountain cliffs, church towers, and ruins, and it is a strange and lovely thing to hear the sweet, rippling melody from an unseen singer in some cranny of an ancient Roman monument.

Ornithologically, my most interesting experience in Italy was a visit to Prince Chigi at Castel Fusano, Ostia. Between his quail-banding station on the seashore and Castel Fusano there stretches a beautiful wood of live oaks, maritime pines, and a great deal of underbrush. The bird life is very rich here under strict protection, and a large number of Raptores nest, among them the Black Kite, Buzzard, Kestrel, Sparrow Hawk, and the rare Honey Buzzard (*Pernis apivorus*). It was an in-

[4] Aschenbrenner, A. H. *Il Canarino;* Ghidini, L. *I Migliori Uccelli Canori Indigeni.* 1932. Milano. Hoepli. 385 pp.

[5] Craveri, M. *Atlante Ornitologico; Uccelli Italiani.* Milano. Treves. 1927.

spiring sight to me to see two Harrier Eagles, or *Biancone* (*Circaëtus gallicus*), and the marvellously graceful great Kite (*Milvus milvus*), the *Nibbeo Reale*. So fascinated did I become with the Italian methods of capturing birds by *whistling* in the *boschetto* and with the trammel nets on the sand-dunes that I asked Prince Chigi whether he would not write an article for American banders on his methods, and his response to my request may be read in the April number of *Bird-Banding* vol. 4, pp. 59–67, 1933.

We often think that because our birds for the most part are different species from those of the rest of the world, we need to be informed only on what is being done in this country, but this is entirely wrong. Life-history problems are the same everywhere, and very important work is being done in this field across the ocean. Every serious student in America should acquaint himself with what is being done in Europe, especially in Great Britain and Germany.

As to the former, it is merely a matter of buying the most significant books and of subscribing to *British Birds*, an interesting monthly magazine dealing almost entirely with life-history papers. If individuals cannot afford this, perhaps they could persuade libraries to get the books and magazines; certainly college and university libraries should be thus provided.

As to German journals, the *Journal für Ornithologie* is the oldest and thought by many to be the best ornithological journal in existence: it publishes a great many life-history articles in detail and with superb photographs. *Vogelzug* is devoted to questions of migration and bird-banding; *Beiträge zur Fortpflanzungsbiologie der Vögel* specializes in nesting studies, while *Ornithologische Monatsberichte* has short articles, some systematic, others biological, and remarkably fine reviews both prompt and discriminating, and also worldwide in scope, articles and books in all languages being reviewed.

The difficulty here is that many Americans do not read German. But scientific German is not very difficult, if one is determined to master it. All my reading knowledge of German I acquired by myself.

I earnestly hope that coöperation between American and European ornithologists will be strengthened by the reading of each other's journals, by exchange of reprints, and by visits—all of which will surely be of mutual benefit.

156 W. Patterson Avenue, Columbus, Ohio.

TO MEMBERS OF THE NORTHEASTERN BIRD-BANDING ASSOCIATION

WE regret to notify our members that at a meeting of the officers of this Association held early in 1933 it was voted unanimously to discontinue our card-filing system at the Massachusetts State House. The files of correspondence accumulated during the past eleven years have been sent to Charles L. Whittle, Peterboro, New Hampshire; and the banding records have been stored with President Fletcher at Cohasset, Massachusetts, where they are consultable.

This drastic move was made in the interest of economy. The system has proved invaluable in keeping our members in close touch with our officers, thereby helping banders in their work and increasing the scientific matter available for publication.

From now on our members will only be required to send banding records twice yearly to the Biological Survey. It is hoped, however, that members will feel free to correspond with the editor of *Bird-Banding*, and that they will send articles and notes to him even more frequently than under the old system.

NORTHEASTERN BIRD-BANDING ASSOCIATION,
By CHARLES B. FLOYD, *Secretary*.

GENERAL NOTES

Mallard Number 555414 Returns Again.—The remarkable record of Mallard No. 555414 continues. Again she has escaped the perils of the hunting season and has returned to her unusual nesting site in a box on the roof of a barn at the Rainbow's End Game Refuge, at Antioch, Nebraska, operated by F. J. Keller.

It seems desirable to present at this time, a brief review of her history, as already recorded.[1] During the season of 1927 she made her first use of the nest box on the roof of Mr. Keller's barn. She was banded on November 29, 1927, and has returned to nest every year since, as follows: March 12, 1928; March 10, 1929; March 11, 1930; April 9, 1931; February 21, 1932; and March 12, 1933.

In addition to having established the most remarkable series of return records that thus far has been made by a duck, Mallard 555414 this year has produced a most unusual set of eggs. She started laying on April 12th and three days later Mr. Keller wrote to the Biological Survey that she had four eggs that measured only one inch in diameter by one and one fourth inches in length. Mr. Keller added the laconic comment that "the depression must have hit her." Since it was certain that these runt eggs would not hatch, the author wrote Mr. Keller, expressing his opinion that our famous duck deserved a "better break" and suggested that the runt eggs be removed and normal Mallard eggs from some other bird be substituted. Mr. Keller acted upon this suggestion and he has forwarded the set of twelve runt eggs to the Survey. He reports that fourteen were laid but two were broken in the nest. Other eggs were given to her and Mr. Keller states that she has taken them without protest. The set of runt eggs is being turned in to the U. S. National Museum.

The old band, while still legible, shows its age so Mr. Keller has placed another band (A604109) on the other foot. He reports that when attaching this second band he found the bird to be in excellent physical condition, although the set of runt eggs would seem to indicate that she has about reached the normal reproductive span of years for a bird of her species. Mr. Keller believes that she is at least ten years old.

The great interest that attaches to this venerable old duck is evidenced by the fact that Mr. Keller reports he has received letters of inquiry from "the Pacific coast and Texas, clear across the continent to Baltimore and Boston." He suggests that if she does finally fall before the gun of a hunter, it would be most appropriate if she could be at once recognized and taken to a taxidermist for mounting. Such preservation would be most fitting for a bird that is known to have produced more than a hundred ducklings. In the opinion of the writer, the mounted bird should be then presented to Mr. Keller, through whose interest and successful management of his game refuge, this interesting history has been made.—FREDERICK C. LINCOLN, Biological Survey, Washington, D. C.

A Palm Warbler Recovered in Newfoundland.—A Palm Warbler (*Dendroica p. palmarum*) which was banded at this Station on October 9, 1932, was caught in the home of Mrs. Frank Greene at Point Verde, Placentia, Newfoundland, on November 28, 1932. The distance from North

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[1] Bull. Northeastern Bird-Banding Assn., Vol. V, No. 3, pp. 92–94, July, 1929.
Bird-Banding, Vol. III, No. 1, p. 32, Jan., 1932.
Bird-Banding, Vol. III, No. 3, pp. 110–111, July, 1932.

Eastham to Placentia is approximately 850 miles. Assuming that this bird was on Cape Cod about October 26, its extraordinary northward flight may be attributed to the violent gales from the south that were experienced here on the 26th and 27th. So far as we can determine, this is the first capture of this species in Newfoundland.—MAURICE BROUN, Austin Ornithological Research Station, North Eastham, Cape Cod, Massachusetts.

Robins and Carolina Chickadees Remating.—A pair of Robins (*Turdus migratorius migratorius*) banded in March, 1931, having been mated three years in succession. In 1932 the male arrived February 10; in 1933 on January 25th, although he did not beign to sing until February 19th. No other nesting males were seen before February 20th. For the first week or two after his arrival the banded male ranged as far as two hundred to three hundred yards from our house, but during the nesting season his range is very restricted. Weights of this bird have been as follows: February 25, 1932, at 5 P.M., 79.8 grams; January 28, 1933, at 5 P.M., 97.1 grams; March 24 at 3 P.M., 89.5 grams; April 12 at 6 P.M., 84 grams.

His mate never comes till March. Her weights have been 77 grams at 9 A.M. March 29, 1932, and 79.3 grams at 4 P.M. April 17, 1933. We have a large population of nesting Robins on our grounds, and females as well as males are often seen fighting. An unbanded female was seen with our banded male on March 5th, but a few days later she had disappeared and the former mate was with him. It may well be that a female Robin on returning and finding her place preëmpted, does not calmly accept the situation and go elsewhere, as does the Song Sparrow (*Melospiza melodia beata*) female, but that she drives off her rival.

A pair of Carolina Chickadees (*Penthestes carolinus carolinus*) were banded in December, 1931, and January, 1932, and have been together continuously ever since. The weights of the male have been as follows: December 31, 1931, at 2 P.M., 12 grams; March 23 at 3.30 P.M., 11.3 grams; October 14, 11 A.M., 10.5 grams; December 9 at 4 P.M., 11.3 grams and April 12, 1933, at 11 A.M., 10.4 grams. Those of the female have been: January 10, 1932, at 1 P.M., 9.9. grams; March 17 at 5 P.M., 10 grams; April 12 at 11, 9.6 grams. These birds regularly range about six hundred yards to the north of our house and about three hundred west, over an area of some thirty-five acres.

Both Robins and Chickadees are provided with colored celluloid bands.—MARGARET M. NICE, Columbus, Ohio, April 20, 1933.

Some Interesting Recoveries.—Between the inception of work at the Austin Research Station, in June, 1930, and April 1, 1933, there have been banded 36,000 birds. Recoveries have been obtained of 417 birds, or 1.15 per cent, comprising mainly Common Terns and Black Ducks, which provide significant data to be published elsewhere. The following recoveries of other species are taken from the station records and presented as being of interest.

Wilson's Snipe (*Capella gallinago delicata*). Four individuals were banded in the fall of 1932. Of these, a bird banded September 4th, was shot at Coinjock, Currituck County, North Carolina, on January 12, 1933.

Barn Swallow (*Hirundo erythrogaster*). One of four nestlings banded on June 28, 1931, was found dead, caught in asphalt on the roof of a building in Panama City, Florida, on September 9, 1931.

Eastern Crow (*Corvus b. brachyrhynchos*). Of thirty Crows banded to

date, we have had but one recovery, that of a bird banded on April 2, 1932, which was picked up dead on Rockaway Beach, Long Island, New York, on November 1, 1932, some 375 miles distant "as the crow flies."

Year round observation of the local Crows has inclined us to the belief that their population is stable. But this cannot be ascertained definitely until the future brings us more banding data. Trapping of the species here may be accomplished easily only from late September to early April, when the birds foregather to feed on the extensive salt meadows. Six per cent of our banded Crows have been recaptured during the breeding season. This does not point to permanent residency, except of a small number of our wintering Crows. But the remainder of the recaptured birds appeared sporadically in the traps during the seasons of migration. This fact, as well as the above record of recovery, might indicate a coastal movement of the species.

Cedar Waxwing (*Bombycilla cedrorum*). A single recovery on one of 169 Waxwings banded, is that of a bird banded May 12, 1931, and killed at Girard, Alabama, January 2, 1933.

Myrtle Warbler (*Dendroica coronata*). An adult male banded on April 30, 1932, was killed by a cat at North Harpswell, Maine, on October 19, 1932. The place of recovery is situated on the coast about twenty miles east of Portland. It is likely that Cape Cod was this bird's wintering grounds. Another individual, also an adult male, banded on May 2, 1932, was "found dead" by two small boys, on a cranberry bog in Harwich, Cape Cod, on February 4, 1933.

Purple Finch (*Carpodacus p. purpureus*). We have had three recoveries from 67 Purple Finches banded. Each of the following records demonstrate the peculiarly erratic wanderings of the species. The first, banded October 5, 1931, took a northerly course upon leaving the station, and was taken in the traps of Mr. Seth Low (a member of the Station's staff) at Quincy, Massachusetts, on January 7, 1932. The second recovery is that of a bird going westward after its banding on October 8, 1931, to be recaptured in Worcester, Massachusetts on January 29, 1932, by Mrs. Kenneth B. Wetherbee. The third record concerns a Purple Finch, banded October 19 1932, which was killed on January 7, 1933, at Concord, North Carolina. Still a fourth Purple Finch, adult female, banded October 8, 1931, was killed at Ellijay, Georgia, on March 4, 1933.

Bronzed Grackle (*Quiscalus q. æneus*). An adult male, banded June 12, 1932, was "found dead" at Millsboro, Delaware, April 4, 1933.

Slate-colored Junco (*Junco h. hyemalis*). The Junco migration of the fall of 1932 reached its peak here between October 22d and 25th. A bird banded on the 24th was retrapped 17 days later, November 10th, at Whitinsville, Massachusetts, a few miles southeast of Worcester, by the Rev. George Allen. In view of the fact that heavy easterly storms swept the coast for four days previous to Mr. Allen's capture of the bird, it is safe to assume that the westward flight was a forced one. This and a local recovery represent our only reports from the 1700 Juncos we have banded. It is to be noted also that from these we have not had a single return.

Eastern Song Sparrow (*Melospiza m. melodia*). We have but one record of recovery in more than 1200 Song Sparrows banded. A bird taken here on October 9, 1932, was killed at Steadman, South Carolina, on December 18, 1931.—MAURICE BROUN, Austin Ornithological Research Station, North Eastham, Cape Cod, Massachusetts.

Trapped Recoveries of White-throated and Vesper Sparrows in South Carolina.—On March 13, 1933, I took at Summerville, South Carolina, White-throated Sparrow B123698. Upon application to the Biological Survey, I find that this bird was banded October 7, 1932, at Milton, Massachusetts, by Mr. R. M. Hinchman.

On March 27, 1933, I took Vesper Sparrow B112814, and I learn from the Survey that this bird was banded October 4, 1930, at North Eastham, Cape Cod, Massachusetts, by Dr. Oliver L. Austin. These are the first birds banded elsewhere to be trapped at this station.—WILLIAM P. WHARTON, Summerville, South Carolina

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Winter Banding at Concord, New Hampshire, 1932–1933.—At my woodland station the past winter Hairy Woodpeckers, present many years, were absent; Downy Woodpeckers were scarce; White-breasted Nuthatches were absent, regular for many years; of Red-breasted Nuthatches, sometimes numerous, but one came. At a feeding station about a mile from mine, the surprising scarcity of Woodpeckers was noticed. New Tree Sparrows were few, or at least few were caught; they exhibited much more shyness about the traps than last winter. Ten Tree Sparrow returns were interesting; they indicated permanent groups by the following facts: out of five returns that were banded on the afternoon of February 9, 1932, there were trapped on December 18th, three; January 19th, four; January 29th, two; February 11th, two; February 25th, four. Other returns also were associated with them at other times. After February 25th the visits of this species were fewer and briefer, and they would hardly ever enter the traps. My little clearing is never visited at once by the whole available number, but only by delegations of one to ten or so. The latest repeat was caught April 13th.

The most interesting period of this season was the time of the blizzard of April 12th and 13th. Fox Sparrows, which would never enter the traps on previous visits on their migrations, were caught to the number of thirty-nine, and repeated with frequency to April 26th; two moved out from this "Station A" to "Station B" in shrubbery on a lawn, and were there caught April 26th and 28th respectively. Juncos for the first time came in good numbers, sixty-five being caught. It appeared that no returns came; at all events, none was caught. Song Sparrows also were present during the blizzard, birds which had never visited these woods to my knowledge except on the occasion of a blizzard in March, 1932.—FRANCIS B. WHITE, Concord, New Hampshire.

Some Tufted Titmice History.—In December, 1928, a pair of Tufted Titmice (*Bæolophus bicolor*) came to my feeding-shelf and by the second day they were so friendly that they ate from my hand, although one of them always came more readily than the other. On January 2, 1929, I banded both of them, one on the left leg and one on the right, so as to identify them without recapturing them, 20744,♀, and 20749,♂.

The following fall, November 11, 1929, 20749 came back with an unbanded mate, and I decided that a tragedy had happened, but later in the winter we found that 20744 was feeding at a shelf a mile and a half away with another unbanded Titmouse.

In the fall of 1930 and the spring of 1931 no Titmice came to my station, which may have been due to the extremely warm winter.

In the fall of 1931 the Titmice were not here, and we decided they would not come again, but on March 24th 20749 appeared with an unbanded mate. I banded this mate April 1, 1932, and during the operation the male

bird was nearly frantic, flying back and fourth almost striking my hands while I was banding her, B160018. This pair were visitors at the station at intervals all summer, and they still come to my old station (although I have moved two and a half miles away), as reported by Miss Fanny Hoyt who now lives there. In June, 1932, the parents came with a full-grown young bird, which received two bands, 51464 and 51467. The male is still feeding at Miss Hoyt's station (April 10th) and he is now at least five years old.—Mrs. Mack Short, Wayland, Michigan.

A Pair of Tree Swallows Attempt to Raise Two Families in One Season.—In *Bird-Banding*, Vol. III, No. 2, p. 42, in "Notes on the Breeding of the Tree Swallows," by O. L. Austin, Jr., and S. H. Low, it was stated that they found that "the only cases of second laying observed occurred when the eggs of the first clutch were either destroyed or deserted. In no nstance did one adult rear two broods of young." I have found this to be true as a rule, but in the summer of 1932, at Pomfret, Connecticut, I had one exception: B88184(♀), a return-3, was mated with C20163(♂), a return-2. Of their five eggs only one egg hatched. The fledgling, F62172, left the nest June 24th. This nest was removed on June 30th, and immediately the Tree Swallows returned, built a second nest, laid a second clutch of four eggs, and on July 13th B88184 was taken on the nest incubating, but the mate had disappeared and the female also deserted the nest the third week in July.—Mrs. Kenneth B. Wetherbee.

A Traveling Potter Trap.—I have rigged a two-celled Potter trap to run on a rope cable from the feeding-platform near the ground to an upper window. A floor of wire screening, turned up about the back and sides of the trap for half an inch or so and projecting a couple of inches in front, holds in the bait and gives sufficient support to the doors when the trap is sprung to allow trap and captured birds to be drawn to the window.

My idea in setting it up was that trapped birds might be drawn in and released without the necessity of going out and disturbing a feeding flock. So far it has proved entirely successful. No bird has yet been lost in transit, and by careful handling the trap can not only be reset at the window and returned to its place without being sprung, but may be returned without frightening the other birds, individuals occasionally remaining to feed on the platform where it rests until fairly pushed off by the returning trap.—Dorothy A. Baldwin, Hardwick, Massachusetts.

Common Tern Recovery in Ontario.—Reports from banded terns of this species (*Sterna hirundo*) indicate that from their wintering grounds, the Caribbean Sea chiefly off the Venezuela coast, they return on their spring migration to nest in the colony in which they were reared or in a near-by breeding area—a north-and-south migration. The following record indicates that some do not follow the usual route, but break away and follow a more westerly course to new territory. Common Tern 676855, banded as an immature July 6, 1928, at Tern Island, Chatham, Massachusetts, was found dead on May 17, 1933, by John Ruttle at Point Clark, Lake Huron, Ontario between Goderich and Kincardine.—Charles B. Floyd, Auburndale, Massachusetts.

A Chickadee Changes Color of Tail.—Chickadee F70803 banded September 24, 1932, repeated October 1st, 22d, and 30th and November 4th.

It was again taken November 24th with a nearly white tail. On September 24th the normal tail was 2.52 inches in length, and no change was noticed on the next dates when the bird repeated, but on November 24th, the tail being white and short, I examined it closely. The tail feathers perhaps should not be called pure white, but rather gray, as there was a little dark pigment in them. There were five of these light feathers on the right of the tail and four on the left. As I proceeded to measure them, I found the stumps of three old broken feathers on top of the light ones. The new feathers measured 2.05 inches, the three old feathers .90 of an inch.—MRS. KENNETH B. WETHERBEE.

Color Variability of the Rump Plumage of the Eastern Purple Finch.—As an example of a not uncommon phenomenon it seems worth while to place on record some plumage-color variations of a female Eastern Purple Finch during a period of approximately two years. B69309 was banded at my Peterboro, New Hampshire, station on May 5, 1931, as a bird whose sex was unknown and of an undetermined age, although it was at least a year old and may have been much older. In my notes, Purple Finches not adult males are commonly indicated at the time of banding by the male and female sex symbols joined together. If such a bird's plumage varies from the normal, the unusual coloration will probably be on the rump, sometimes, but not always, with accompanying unusual colorations elsewhere, such as on the crown, throat, sides of breast, tips of greater coverts, etc. B69309 when banded presented nothing unusual in the above respects, excepting that the rump was especially of a yellowish-olive color, a quite common variation but not one indicative of sex, as shown by the fact that such birds may later take on the adult male or normal female plumage.

On the following July 3d the bird repeated, and it was inferred to be a female because the band was polished, no doubt by frequent contact with her eggs during incubation. She repeated again on the first day of the following October after the post-nuptial molt was over. A marked change had taken place: her rump feathers and upper tail coverts were now of a pale rosy color, and scattered feathers on the breast were of similar coloration, while as a whole she had assumed a general buffy cast.

In 1932 she was taken as a return-1 on April 18th. Her rump now had become distinctly more rosy, no doubt because of abrasion of the barbules. Her crown feathers now, viewed tangentially, were also seen to be pale rosy. On the following June 18th she repeated, her band being again well polished. Since adult plumage would have been assumed the previous fall, it was of course obvious that the bird was a female. During the summer and the following fall she repeated frequently up to August 10th, on which date no visible molt was under way.

This spring (1933) on April 5th she was recaptured as a return-2, but all the rosiness of the previous year had disappeared, and her rump had become conspicuously yellow, the entire bird retaining her faint buffy cast.

Since Jonathan Dwight, Robert Ridgway, and Witmer Stone[1] do not mention color-changes in any way similar to the above, or, indeed, mention the common variable coloration of the rump tract in young males or fe-

[1] See Dwight: *The Sequence of Plumages and Moults of the Passerine Birds of New York*, pp. 173 and 174; Ridgway: *Birds of North and Middle America*, Part 1, pp. 128 and 129; and Stone: *The Molting of Birds with Special Reference to the Plumages of the Smaller Land Birds of Eastern North America*, pp. 139 and 140.

males of any age, it seems patent that such colorations, were lost by fading or were never present in the skins examined. If the bird-skins studied by the investigators mentioned were originally without rump-colorations of the sorts described, then such colorations noted at present may be due to the nature of the food eaten at banding stations, for Dwight (*ibid*, p. 174) writes that caged male Purple Finches often lose their brilliant color, which is never regained while the birds remain in captivity, a fact believed to be due to the loss of some ingredient in their food. He reports that the colors assumed by such males are "bronzed or golden."

This circumstance lends some support to the view that the loss of rosy plumage described may have had a similar explanation—which, if true, would make it likely that the change from yellowish to rosy was caused by the qualities of the food eaten. However, it so happens that we caged one of Mrs. Whittle's Purple Finches (B50051) in October, 1928, which was unable to fly well when banded, a juvenile bird which we kept captive till the spring of 1931. His food during this period was largely sunflower seeds with some ash and Indian currant seeds, rose seeds, and red maple and lilac buds. In the fall of 1929 he assumed a faintly rosy plumage, which was replaced at the 1930 molt by a much more rosy plumage, though not of the intensity or normal old males. That variable rump-coloration is common among olivaceous birds (immature males and females) and sufficiently so to warrant mention in my notes at the time of banding is shown by the figures for April, 1933. Out of twenty-five birds (not including adult males) twelve were so described, and thirteen had rump of normal coloration. These birds were banded as they reached here from their winter quarters, and so far as known they had never before eaten sunflower seeds, so that, if the variations noted were due to their food, other kinds than sunflower seeds were the cause.

The conclusion of Dwight and the plumage-history of B50051 are conflicting. The occurrences of varied rump-coloration are numerous, and many appear to occur among birds not having previously visited banding stations, so that I am disposed to believe that the artificial food-supply played little part in the changes described in case of B69309, and that in general it does not account for the variously colored rump feather tracts observed.—CHARLES L. WHITTLE, Peterboro, New Hampshire.

RECENT LITERATURE

The Birds of Newfoundland Labrador.—by Oliver Luther Austin, Jr. This well printed quarto volume, Number VII of the Memoirs of the Nuttall Ornithological Club, supplies a very welcome addition to the regional lists of North American birds. Dr. Austin has brought to his task a wide knowledge of the subject treated, for he spent three summers in exploring and collecting along the Labrador coast and has in addition read very extensively the literature on the region and has also made careful studies of much ornithological material in museums and private collections.

In his introductory chapters Dr. Austin gives a brief review of ornithological explorations in Labrador from earliest accounts to the present time and then gives the itineraries of his own three trips to the region. The first of these, in 1926, consisted largely of reconnaissance work in preparation for the collecting trips of the next two summers but in 1927 and 1928 intensive studies, including considerable bird-banding, were carried on by Dr. Austin, ably assisted and abetted by his father, Dr. Oliver L. Austin, Sr.

Then follows a very interesting discussion of the origin and history of the

Labrador avifauna, and following the annotated list of birds is a valuable bibliography occupying some seventeen pages.

One hundred and seventy-seven species and subspecies of birds are listed from Newfoundland Labrador but twenty-eight of these are placed upon the hypothetical list as not corroborated by authentic specimens, while twenty-seven others are listed as of casual occurrence only in the region.

As might be expected, water birds and shore birds form a very large part of the avian population as compared with land birds, the proportion being ninety-nine species and subspecies of the former to seventy-eight of the latter. Some of the studies of the breeding habits of birds which are only seen in the United States as winter visitors, are of especial interest, while some very suggestive return records of banded birds are included in the volume. Outstanding among these banding returns are those of two Arctic Terns, banded as nestlings at the Red Islands in Turnavik Bay, one of which was recovered near La Rochelle, France, ten weeks after banding, and the other near Port Shepstone, Natal, South Africa, after a journey of some nine thousand miles in about ninety days, a long distance record for the recovery of a banded bird. Another interesting recovery was that of a Razor-billed Auk, banded August 11, 1928, which was found dead and badly oiled at Southampton, Long Island, N. Y., March 3, 1929.

As might be expected from an enthusiastic bird-bander like Dr. Austin, studies of distribution occupy considerable of the author's attention. Eight pages, for example, are devoted to a discussion of the Canada Jay, and to an exposition of the writer's theories as to the origin of the various races of this plastic species and their manner of distribution. But the volume should be read to be appreciated and we recommend it highly to all students of ornithology.—J. B. M.

Der Vogelzug, Vol. 4, No. 1, January, 1933.—This number opens with an account by Schüz of a great invasion of waxwings (*Bombycilla garrula*) in middle Europe in 1931–1932. After reviewing the available facts, Schüz concludes that the berry-crop in the breeding range and its immediate surroundings controls the bulk of the migratory movements of this bird and that lack of berries precipitates extensive wanderings; that the weather apparently has no immediate influence, yet the migration is no mere forward groping for food, but is apparently conditioned by endocrine secretions, just as in typical migrant birds.

Schildmacher contributes the first of a series of studies on the physiology of the migratory instinct. He reports here on experiments in which various doses of the female sex hormone were injected into the breast muscles of young and old female Redstarts (*Phœnicurus ph. phœnicurus*) that were trapped during the autumn migration. He found that during the fall migration both young and old females show a loss of, or a great reduction in, the migratory "unrest" when given certain doses of female sex hormone (the effective doses varying from four injections of five mouse-units each to four injections of thirty mouse-units each). Towards the end of the migration season doses of less than twenty mouse-units proved ineffectual. Doses of more than fifty mouse-units failed to lessen or destroy the migratory uneasiness, but this is interpreted as due to the fact that such large amounts of hormone tend to put the bird in the condition of a spring migrant. The fact that the minimum effective dosage increases towards the end of the migration season indicates that autumn migration is correlated with a diminution of the sexual hormone. Whether the gonads are really the primary factors or whether they themselves are conditioned by other organs will be dealt with in further investigations.

Technau interprets data on banded Black-headed Gulls (*Larus ridibundus*) relating to the geographical shifting of the breeding-spots of the individual birds. He finds that the average shifting in year-old birds is between one hundred and two hundred kilometers. If one takes as a criterion the distance between the birthplace and the breeding place the next year or years, and tabulates the birds accordingly, one finds that in the group between one thousand and two thousand kilometers the yearling birds are two and one third times as numerous, and between one thousand and five thousand kilometers, seven times as numerous as the older birds. In general it may be said that distant rediscoveries of gulls in fully adult breeding plumage are often due to sickness which prevents their returning. Yearling birds are usually not be be found in the breeding region even in April, but mostly appear in their colonies only in the course of the breeding season.

Among the short notes we find the first recovery of a banded Swift (*Apus apus*) in Africa: the bird was banded at Celle (52° 37′ N., 10° 5′ E.) on July 8, 1931, and was recovered at Tumba Kapia, Kasai district, Belgian Congo, on August 31, 1932. Another interesting record is the recovery of an Oriole (*Oriolus oriolus*) at Kasr, Egypt, banded in Pomerania.—H. F.

Der Vogelzug, Vol. 4, No. 2, April, 1933.—Hagan opens this number with an account of the spring migration of 1932 at Lübeck with respect to the climatic conditions. The season was characterized by extreme periods, and the migration seemed to be roughly correlated with these climatic changes.

Sturm writes of the waning of migration and flights at high altitudes and suggests that at times the last migrants of a species may fly high overhead to get to their destination while to the earth-bound observer the migration, although still going on, seems to be on the wane.

Steinfatt describes his experiences of bird migration on the Pyrenean Peninsula on the Mediterranean in the autumn of 1932, listing the birds seen by him here.

Ecke started a comprehensive scheme of banding Barn Swallows in 1931. In the autumn of that year the great swallow catastrophe occurred (previously noted in this journal) and this naturally destroyed much of the otherwise probable percentage of returns the next year. A few of the birds did survive, however, and he finds that they all returned from one to eighteen days later in 1932 than they had in 1931 (when they were banded as spring migrants). Data are also presented regarding the wanderings of young swallows. The local breeding population in 1932 was 30 per cent less than in the previous year, probably because of the disaster in the autumn of 1931.

Drost and Schüz present compilations regarding the after effects of the swallow disaster of 1931 as evidenced by the status of the birds in 1931 in various German provinces and in Poland, Esthonia, Finland, and Scandinavia. Most places suffered a definite diminution in the breeding swallow populations, but it is hoped that lessened competition between the survivors may serve to bring the birds back to their former numbers.

Schüz contributes another part of his compilations of return records and recoveries of birds banded at non-German European stations, and Ruthke describes the autumn migrations of the common Curlew (*Numenius arquata*). The adults appear to migrate apart from the birds of the year, at least they appear to form flocks of their own before actually leaving.

Among the shorter articles are notes on the early summer migration of the Lapwing (*Vanellus*), on the wanderings of the Puffin (*Fratercula arctica*) in the Mediterranean and off the southwestern portion of the Portuguese coast, and on the banding records of the Coal Tit (*Parus major*) and the Blue Tit (*P. cæruleus*).—H. F.